

SIXPENCE

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FANTASQUOND

This article is taken from a description published in The Wireless World, of some of the equipment used for the stereophonic sound effects in Walt Disney's film, "Fantasia."

In this film, sound is not so much the accompaniment as the starting point of the ideas expressed in the animated colour cartoons shown on the screen. Special equipment was sent from place to place with the film and auxiliary loud speakers were installed to handle the large sound output, and to ensure correct balance for the stereophonic effects.

The raw materials, to speak, from which the final sound tracks were composed, were drawn from microphones distributed at strategic points throughout the body of the orchestra. After much testing, eight simultaneous recordings were finally made with microphones at six points in the orchestra and two others as follows:- (1) Violins, (2) Violas, (3) Brass (4) Cellos (5) Wood Wind (6) Percussion (7) Mixed output from whole orchestra (8) Microphone pick-up at a distance from the orchestra. The last two sound tracks provided what might be termed first proofs of the recording. These were examined critically by the conductor, and if the efforts of his players fell short of his ideas of what the music required, adjustments were effected when the final sound tracks were made up from the six primary channels arriving from different points in the orchestra. These were combined into three tracks associated with the centre, left and right hand group of players, and when reproduced through loud speakers similarly placed in the space behind the screen, gave the effect of auditory perspective obtained from listening to a real orchestra. With the help of extension speakers arranged around the auditorium, the audience were at times made to feel that they were in the midst of the players themselves.

Obviously some of the illusion would be lost if the volume range of the orchestra, normally about 70 lb. were restricted to the accepted limit of 35 lb. for variable area recording. Accordingly, a system of automatic volume

expansion was introduced and a fourth sound track was employed to control each of the three main sound tracks. The latter were of double width which increased the available range to 41 db. Nevertheless, to be quite sure that the film noise due to gain and scratches should be at all times completely suppressed, it was decided to limit the recording range to 25 db and each sound channel was passed through a volume compression circuit which kept down maxima and brought up minima within those limits. The automatic fluctuations of bias in the compression circuits were made to modulated fixed frequencies which were recorded simultaneously as a complex tone on the fourth track. In playing back the record filters separated the three control frequencies (250, 630 and 1600 c/s) and after rectification the variations of amplitude were applied as control bias to the variable gain amplifiers at the head of each amplifying channel.

The four sound tracks occupy the full width of a standard 35mm film which is printed quite separately from the picture. The sound film is run through a separate machine, which is synchronised with the picture projector by means of a master three-phase generator and separate "Selsyn" motors. In the special sound head which has been developed for this purpose a single reversible exciter lamp is provided which enables the spare filament to be brought into action merely by reversing the lamp in its socket. The light is formed into a beam one mil. wide and of a length sufficient to scan all four tracks. As the light covers the whole width of the film, the standard rotary stabiliser and solid take-off drum could not be used, and a special scanning aperture in conjunction with a magnetically driven drum was employed. The scanning light, modulated after passing through the film passes into the four separate photocells housed together with their matching transformers in a compartment on what would be the front of the machine if it were a picture projector.

After passing through the usual operator's fader control relays, the output from the three main sound tracks goes via pre-amplifiers to the main amplifier channels. The complex control tone is amplified separately and applied to each of the variable gain amplifiers associated with the main channels where the appropriate tone is selected by a band-pass filter rectified, smoothed and applied as bias to the amplifier. The control stage consists of two 6K7 valves in push-pull and manual control of the expansion characteristic is available in order that the overall volume range may be adjusted to suit the size and acoustics of individual theatres.

The power output available from each of the main channels is 120 watts, and this is absorbed by two of the standard R.C.A. multiple loudspeaker units. These units each consist

of two HF "tweeters" feeding into cellular horns and four large diaphragm speakers loaded by re-entrant horns. Separate 50 watt amplifiers taking their input through attenuator pads from each side channel feed 22 small cabinet speakers arranged along each side of the theatre. Actually the amplifiers rated at 120 watts are each capable of delivering 200 watts with only 2 per cent distortion, so that in practice, a total of 700 watts distributed through 80 speaker elements was available at the first showing of the film in New York. This power is, of course, in reserve for climaxes in the music, and will not always be used in the smaller theatres to which the full stereophonic equipment is taken.

In addition to the specially combined single sound track which has been printed for standard equipment there is another simplified version of "Fantasound" which retains the volume expansion feature, but not the stereophonic effects. In this the control track is printed in the spaces between the sprocket holes at the edge of the film, and is used to vary the strength of the 96 cycle current produced by the sprocket holes themselves. A variable gain amplifier is introduced in the chain leading to the screen loud speakers, and additional house speakers are brought in to handle climaxes, the amplifier feeding them being normally biased to cut-off. This system seems very promising for screen plays where dialogue can be confined to the central loudspeakers, the side speakers being brought in only for music or special effects.

One way or another the film "Fantasia" has created a stir of the first magnitude, and while critics may wrangle over this or that aspect of the association between art and music the significant thing from the technical point of view is that stereophonic sound is being given its first commercial trial.

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THE NEW IMPROVED AMATEUR RADIO

With the co-operation of the New South Wales Division the Magazine will take new form as from the next issue.

It has been decided to incorporate into Amateur Radio the New South Wales Divisional Bulletin, and to increase the number of pages to fourteen.

We apologise for this issue being very small, as with the re-organisation of the magazine, various details were held up with the result that we were short of copy.

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ON ACTIVE SERVICE.

Hereunder a list of Queensland, Sth. and Western Australian and Tasmanian names on Service, compiled from cards returned in the Federal Census. If you are on Service and your name does not appear on this List, kindly forward full particulars to the Federal Secretary, 21 Tunstall Avenue, Kingsford, N.S.W.

QUEENSLAND.

Captain J. Foldi, VK4KT
Lieut. C.E. Burns, VK4ZY
Sgtn. W.G. Clayton, VK4WG
Corporal J. Halyday, VK4HZ
L/C A. Johnson, VK4PX
Lieut. H. Wooster, VK4VH
Gnrr. G.H. Gray, VK4JP
Corp. M.J. Wratten, VK4MW
Corp. J. Jackson, VK4CN
Sppr. H. Dearness, VK4KW
Major J. Love, VK4JL
Corp. T. Dawson, VK4CH
Sgt. K. Schleicher, VK4KS
Sgtn. E.H. White, VK4EW
Lieut. G. Harley, VK4GH
Lt. Col. R.E. Seinsbury, VK4YJ
S/Sgt. A.E. Carter, VK4LT
Lieut. J.F. Heine, VK4JX
Tlgrph. C.W. Marley, VK4CJ
Tlgrph. C. McCouchman, VK4KZ
WT/3 S.R. Baxter, VK4FJ
Tel. F. Lubach, VK4RF
R/O E. Delmar, VK4XZ
Corp. A.K. Bradford, VK4KK
Corp. A.H. Tilse, VK4WO
A.C.1 J.R. Martin, VK4MX
Sgt. J. Allan, VK4AN
Corp. E.R. Ashlin, VK4RA
Corp. J. Makin, VK4OK
A.C.1 K. Karppinen, VK4KN
F/O A.E. Walz, VK4AW
A.C.1 J. Harvey, VK4NA
P/O H.V. Heeler, VK42
R/I T. Alexander, VK4TA

SOUTH AUSTRALIA.

Pto. P.R. Keddie, VK5KZ Army
Corporal J.G. Phillips, VK5BW
Pto. J.P. Sullivan, VK5JK
Lieut. E.A. Charles, VK5YQ
Lieut. R.T. Manuel, VK5RT
Corporal R. Anthony, VK5CM
L/Corp. H.J. McCarthy, VK5MC
Corp. G.F. Lucas, VK5LL
Tel. J. Fairweather, VK5FV Navy
WT/3 J.A. Scriven, VK5SN
R/O R.D. Elliott, VK5RD M/Ny
A.C.1 R.J. Townsend, VK5HT RAAF
Sgt. F. Holsten, VK5LK
Sgt. J. Kilgariff, VK5JT
Sgt. R. Harris, VK5FL
L.A.C. H.K. Stacey, VK5XA
Sgt. H. Hobcroft, VK5RE
Sgt. W.L. Heinrich, VK5HR
A.C.1 F. Bourne, VK5BU
Sgt. C.A. Ives, VK5AF
P/O J. Allan, VK5UL
A.C.1 R.W. Davoy, VK5KD
M/Vya A.C.1 M. Anderson, VK5MA
L.A.C. P. Davoren, VK5KM
L.A.C. H. Green, VK5OJ
A.C.1 A. Phillips, VK5GX
A.C.1 J.W. Shiled, VK5ZZ
Sgt. J.A. Smith, VK5JR
A.C.1 L.V. Wallbridge, VK5UX
Ft. Lt. L.A. Deane, VK5LD
L.A.C. H.V. Lunn, VK5HL
L.A.C. C.A. Ferguson, VK5CJ
Corp. R.K. Deane, VK5HK
Sgt. A. Sutherland, VK5XB
A.C.1 E.L. Andrews, VK5EL

WESTERN AUSTRALIA.

Corporal	C.H.Reeves	VK6?	Army	Sgt.	E.Robins	VK6RB	RAAF
Sgtnlmn	K.S.Anderson	VK6KS	"	Corporal	A.F.Vahl	VK6JB	"
Sgt.	K.Stittfold	VK6?	"	Sergt.	G.Heindricks	VK6RF	"
Sgtnlr.	L.J.Symonds	VK6LS	"	Sergt.	A.Foxcroft	VK6AF	"
Lieut.	E.Grey	VK6ZX	"	Tlgpst.	E.Potts	VK6ZO	Navy
Corp.	J.Grogan	VK6EI	"	L.Tel.	W.J.Sperring	VK6SP	"
Sgt.	G.W.Ashley	VK6GA	"	Lieut.	R.L.Devitt	VK6DR	"
Sgt.	J.W.Thomson	VK6TM	RAAF	P/O Tel.	C.A.Young	VK6CY	"
Sgt.	R.C.Growthor	VK6CC	"	Tel.	E.R.Pearce	VK6TP	"
Sgt.	J.E.Goddard	VK6JG	"	Tel.	I.Ginbey	VK6IG	"
A.C.1.	V.H.Harris	VK6NL	"	Tel.	A.H.Rippen	VK6GR	"
L.A.C.	F.H.Wright	VK6FR	"				
A.C.W.	Ruth Harris	VK6YL	"				
F/O	W.Weston	VK6WM	"				
W/O	J.Reid	VK6EE	"				
Corp.	E.Langenschied	VK6EL	"				
Sgt.Plt.	W.Sands	VK6BS	"				
A.C.1.	R.Collis	VK6LY	"				
F/O	S.Madden	VK6MN	"				
Sgt.	W.J.Lewis	VK6YB	"				
A.C.1.	J.Gabbertas	VK6GB	"				

TASMANIA

Sgtnlmn.	G.Richardson	VK7GR	Army
Sgtnlmn.	R.H.Kilby	VK7RK	"
Corporal	H.Hopwood	VK7GJ	"
Sgtnlmn	H.D.Spence	VK7DS	"
Lieut.	T.Connor	VK7CT	"
A.C.1.	C.J.Robinson	VK7KR	RAAF
A.C.1.	K.Saxon	VK7ER	"

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SLOUGH HATS AND FORAGE CAPS

Another month gone and once more, thanks to my few never-failing correspondents, we hope to fill this page.

Our first news concerns VK3RJ, and when I get my job with the big evening newspaper, I'll report it like this..Dastardley and unprovoked attack on Federal QSL Bureau...Valuable WIA officer Loses Sleep...."From our Special Correspondent at an Eastern Capital we learn that one night recently a passing "visitor" fired a dozen or more shots of 6 inch calibre at our sleeping QSL Officer, etc. etc..." What's so important about that you want to know?...well, they MISSED...sitting shot and all, and their best was 150 yards off...and me wanting to be Fed QSL Officer...wouldn't it?????. And now he sleeps "under" the bed.. so I hear on unconfirmed authority. As he only woke up to hear the last shot, it may be right. Hi!

Roger Torrington VK2TJ...back from "Our North West" gave us a very enjoyable night at NSW Div., Meeting, explaining Jap. Raids on 2MO's old town. The highlight of the piece, to my mind, was about the second raid. After the first one, before which,

of course, A la Australian, there were no shelters, etc., the lads decided to construct personal dug-outs of 44 gallon drums sunk into the ground and sandbagged around the top. But though these appeared very nice and safe before raid number two, with the approach of the bombers they appeared far too close to the buildings, and the scrub 300 yards away a far more desirable spot. Roger says that great minds really do think alike, for, as he scrambled out of his, all the others were doing likewise. With the roar of bomber engines behind them, the pace towards the sheltering scrub was a cracker, every nerve being strained so as not to be last. Suddenly, from over the rise just behind the scrub, very low and heading straight towards the speeding personnel, shot four Zeros. Roger definitely assures me that the human frame though propelled by any amount of speed, determination, Savardupois or anything else, head first, tummy first, or what have you, cannot, like the Armadillo, dig a hole in the earth and disappear out of sight of approaching Zeros. Our young Ham, realising this, quickly turned at right angles to the line of flight and simply "flow" into the scrub. Sounds a bit "fast" to me, but that's what Roger said.....more or less.

W3ERP is "holidaying" over here with us. He was a ten metro phone lad, so perhaps some of you know his sigs. His QRA was in Philadelphia and just now he is Op on an Army Transport. He was at our Divisional Meeting and spent Sunday with 2TI....a swell guy, oms, as they say in God's Own Country.

Getting the Federal Atmosphere and listening to 2EO "on Dx"... ..are some other Ws we hope to meet before they get back home. Some of them are...W5FFX...Cecil Gibbs hails from Little Rock... Arkansas, and also has a first Class ticket. Works for both U.S.N. and R.A.N. and can spin plenty of Yarns about Pearl Harbour... (Can we hear them, or must we wait till "after"?) Other pastimes are...outing American Peanuts, entertaining Xls...and sending the Weighing Machine indicator "far from Zero."

W7LQ...Jimmy is an oldtimer on the air, but it is some time since he called CQ from Washington as he has been at sea around K7 land since about 1933.

W6RBA/W9JCW...Jerry originally hails from Milwaukee, Wisconsin, but last operated from Santa Anna California. Jerry was one of the lucky ones who escaped injury at Pearl Harbour (what another story this column has to wait on????).

W2HPT....Edwin hails from Fort Teo, New Jersey, and is just getting used to VK....its easy om, everybody is glad to have you here.

Lastly to quote "VK4RY..."I'm sure all VK's will join in

wishing all visiting W's, particularly the above mentioned, all the best, and may it not be too long before we are once again chowing the rag across the Pacific.

Sorry there is nothing in the page this month, but I yielded to the temptation to tell you about Roger...but it doesn't sound near as good as he tells it. I have more VK news but it will have to stand over till next month.

2YC

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FEDERAL HEADQUARTERS

The monthly Meeting of the Federal Executive was held as usual at Y.M.C.A. Buildings, all Members being present. Chairman extended a welcome to Mr. Neil Gough VK2NG upon his election to the Executive upon the resignation of Mr. A. Joscelyne VK2AJQ.

General regret was expressed at the lack of news from VK5 and it was decided to put the same scheme into operation in that State as was being done in VK7.

Census cards still continue to come along in ones and twos, and the total number received is now approaching 300. Divisional Secretaries are asked to make every endeavor to see that their members return the cards irrespective of whether the ham concerned is on active Service or otherwise.

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NEW SOUTH WALES DIVISION

Two very interesting visitors, Herman Getzel V3ERP and Roger Torrington on VK2TJ were present at the June General Meeting of the Division held at Y.M.C.A. Buildings on Thursday 18th June.

Members were very interested to hear of V3ERP's hamming in pre-war days. Herman received quite a surprise of the amount of knowledge displayed by VK's of American gear, particularly tubes of more than 50 watts plate dissipation. Roger Torrington VK2TJ enthralled listeners with a bomb for bomb description of the raid on Wyndham some time ago, and it is understood that Roger's time for the hundred is now in the world record class!

The Chairman gave members details of several tests he had been present at, in connection with the State War Effort Co-ordination Committee but stated that as yet no word had been received from the Naval authorities regarding the use of U.H.F. Bands for the auxiliary scheme.

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VICTORIAN DIVISION

Members of the Victorian Division are notified that the Annual General Meeting will be held at the Rooms 6th Floor 191 Queen Street, Melbourne on Tuesday, 4th August at 8 p.m., when it is hoped that there will be a good muster.

The business of the meeting will be:-

1. To receive and adopt the minutes of the last Annual General Meeting.
2. To receive the President's Address.
3. To receive and adopt the balance sheet.
4. To elect a President.
5. To appoint an auditor.
6. General Business.

Nominations for Council must be in the Secretary's hands not later than Thursday July 23rd 1942.

Nomination forms, which are enclosed in the magazine must be signed by both the nominator and seconder, and also by the nominee. All must be full members, financial at 30th June.

R.A.C. Anderson - Secretary.

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At the last general meeting members of the Army Headquarters Signals under the leadership of Major Chippindall 3VU, were present together with sundry experimental gear. Staff Sgt. Scott, 3SS; Sgt. Williams 3WE; D. Bowie 3TC; G. Trythale 3DA; R. Day 3RD; G. McGowan 3GO; J. Duncan 3VZ; M. Johnson; W. Pitts; J. Boutcoal; C. Falvey; and others were amongst the visitors.

It has now been learnt that Snow Campbell 3MR was badly injured in a plane crash prior to his capture, and has been in rather a bad way. However, the latest news is that he is now rapidly regaining health and strength.

Congratulations to Gavin Douglas 3YK who was married recently. We're still waiting to hear something of your adventures OM.

Major H.L. Andrews 3HY, who was attached to Medical Services is the latest to be reported missing presumably in the Malayan Campaign.

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HAMADD

3RX wants to buy:-

1 902 type Cathode Ray Tube, in good order. Write - C. Sorlo, Box 2600 Melbourne.

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H. BURDEKIN, K. RIDGWAY.
R. J. MARRIOTT, VK3SI; C. QUIN, VK3WQ.

Meeting Night—First Tuesday in each month.

**THE WIRELESS INSTITUTE
OF AUSTRALIA**

N.S.W. DIVISION

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KINGSFORD**

Telephone: FX 3305

Meeting Place:

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Councillors: V. BENNETT, VK2VA; N. GOUGH,
VK2NG; R. SMITH, VK2AIU; R. MILLER.

The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

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QUEENSLAND:

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BOX 547E, G.P.O., HOBART.